

The Impact of Contextual Factors on Performance of a Smartphone-Based Word List Test

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SUBMISSION DETAILS

What is the Methodological Question Being Addressed? Smartphone-based cognitive tests can be used to measure cognitive abilities in the real world and may complement traditional neuropsychological tests. However, it remains unknown how contextual factors such as a person's environment, who a person is with, distractions, and interruptions impact test performance and test validity.

Introduction In this study, we aim to understand how contextual factors impact performance on a mobile learning and recognition memory test, the Mobile Variable Difficulty List Memory Test (VLMT), designed for use with people with serious mental illness. We examined how context impacts performance and how context may impact convergent validity of the VLMT with measures of lab-based verbal learning and performance-based everyday functioning.

Methods Participants with schizophrenia, schizoaffective disorder, and bipolar disorder completed in-lab assessments of verbal learning (Hopkins Verbal Learning Test, HVLMT) and functional capacity (UCSD Performance-Based Skills Assessment-Brief, UPSA-B). Both the HVLMT (part of the Measurement and Treatment Research to Improve Cognition in Schizophrenia Cognitive Consensus Battery) and the UPSA-B have been used as outcome measures in treatment trials aimed at cognition and functioning in schizophrenia. Participants completed 30 days of daily self-report surveys and the VLMT once every other day (three trials/session) and self-reported if they were distracted or interrupted after each session, as well as where they were and who was around them. Linear mixed models were used to understand the impact of context on VLMT performance (percentage correct), and Spearman correlations were used to understand how different contexts impacted convergent validity.

Results On average, participants reported distractions during 40.2% of VLMT assessments and interruptions during 27.0%. They also reported that they were away from home during 33.6% of VLMT assessments and that they were with others during 54.6%. Presence of self-reported distraction (estimate=4.9 percent, S.E.=.74, $t=6.7$, $p<.001$, effect size=.16), interruptions (estimate=7.2 percent, S.E.=.824, $t=8.8$, $p<.001$, effect size=.21) and being away from home (estimate=2.6 percent, S.E.=.76, $t=3.5$, $p=.001$, effect size=.08) negatively impacted VLMT performance ($p's<.001$). The presence of other people did not impact VLMT performance ($p=.712$). Performance is more highly correlated with the HVLMT when participants were not distracted ($\rho=.525$ vs. distracted $\rho=.390$), were not interrupted ($\rho=.507$ vs. interrupted $\rho=.409$), were alone ($\rho=.515$, vs. with others $\rho=.392$), and at home ($\rho=.492$, vs. away $\rho=.391$), all $p's < .001$. A similar but attenuated pattern emerged with the UPSA-B, with the exception of home ($\rho=.400$, $p<.001$) vs.

away ($\rho=.456$, $p<.001$), wherein the difference in the correlations was such that though participants performed better on the VLMT when they were at home, performance away from home was more highly correlated with UPSA-B scores.

Conclusion The impact of contextual and environmental factors on VLMT performance is significant but small. Context had a greater impact on convergent validity of the VLMT with the HVLMT than the UPSA-B. However, even if participants were distracted, interrupted, or away from home, performance was still highly correlated with both in-person measures. Cognitive performance in different environments (e.g., home vs. away) may provide information about cognition that can translate to real-world functioning.

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Guidelines I have read and understand the Poster Guidelines

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